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Survival and differentiation of endogenous Schwann cells migrating into spinal cord under the influence of neurotrophic factors

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Abstract

Schwann cells are a major figure in the process of regeneration in the peripheral nervous system. They migrate into the injury region of spinal cord, which are involved in remyelination and are regarded as the source of numerous molecular signals that could potentially support the growth of axons in the central nervous system. In the present work we describe the behavior of migrating into the injury dosed region spinal cord Schwann cells under the influence of neurotrophic factors - vascular endothelial growth factor (VEGF) and fibroblast growth factor 2(FGF2), delivered by direct introduction of «naked» plasmid DNA and by transplantation of genetically modified human umbilical cord blood mononuclear cells. Using immunohistochemical detection of markers of S100, GFAP, Krox20 and HSP25 identified different phenotypes of migrating into the spinal cord of endogenous Schwann cells. Found that greatest influence on their numbers in the injury region provides local delivery of genes vegf and fgf2 by human umbilical cord blood mononuclear cells. However, the direct introduction of the same plasmid may also be promising in the case of synthetic platforms that enhance its transfection activity.

Keywords

FGF2, Plasmid, Schwann cells, Spinal cord injury, Umbilical cord blood cells, VEGF